



# STUDY OF OSTRACODS DIVERSITY OF POPAT KHED DAM NEAR AKOT TAHSIL, DISTRICT AKOLA (M.S.), INDIA

Shelekar A L

Assistant Professor Department of Zoology, Shri. Shivaji Art's, Commerce and Science College, Akot Dist. Akola (M.S.), India

## ABSTRACT

The Popatkhed Dam is principal fresh water body located in Popatkhed village of Akot Tahsil in Akola District of Maharashtra State. Akot is a tahsil place and it is 45 km north side away from Akola. In present investigation Popatkhed Dam is 15 km north side away from Akot tahsil and it is about 778 M. Above from sea level and 90 km north side from Dharni (Melghat). **The Ostracods were studied from June 2021 to May 2022. During this period total 2 species of Ostracods were found in sample of water three sites A, B and C of Popatkhed Dam.**

**KEYWORDS:** Popatkhed Dam, Ostracods Diversity.

## INTRODUCTION

Ostracods commonly known as seed shrimps and also Ostracods class of a Crustacea and found in a wide variety of aquatic habitats. It is bivalve and appear like small seeds. The body of Ostracod is laterally compressed and protected by a bivalve like such as chitinous or calcareous valve or "shell". Ostracod occurs in both water standing as well as running water. The Ostracods this organism very good food for the fishes and aquatic organisms (Tonapi, 1980).

Popat khed Dam is 15 km north side away from Akot tahsil and it is about 778M. Above from sea level and is at 77° 5' O" E longitude and 21° 12' 46" N latitude and depth of water is 42.6 m (140 feet).

The gross storage capacity of water is 10,709 km<sup>3</sup> (2,569 cu. mi). the water of this dam is primary used for washing, bathing, fishing activities, agricultural and other domestic purpose but now it is at a transitional state with respect to degradation.

## MATERIAL AND METHOD

Sample for planktonic study were collected monthly from three sites of lake. The samples were collected in the morning hours between 8.30 a.m. to 10.30 a.m. 50 Lt. of water sample was filtrated through the plankton net made of bolting silk number 25 with mesh size 64 lime the collected samples were allowed to settle down by adding Lugol's Iodine. Normally sedimentation requires 24 hrs. after which supernatant was removed and concentrate was made up to 50 ml. depending the number of plankton and preserved in 5% formalin for further studies.

For the quantitative study the concentrated sample was shaken and immediately one drop of sample was taken on a clear micro slide with the help of standard dropper the whole drop was then carefully covered with the cover glass and observed. Plankton identification up to genera and whenever possible up to species level was classified according to keys given by Prescott (1954), Edmonson (1959), Sehgal (1983), Adoni (1985), and APHA (1985) and standard analysis was undertaken as per Zar (2005).

Quantitative study of plankton was done by Sedgwick – Rafter Cell method

### Sedgwick – Rafter Cell Method

The Sedgwick – Rafter Cell is a special kind of slide similar to the Haemocytometer. The cell has a 50 mm x 20 mm x 10 mm rectangular cavity that holds 1 ml. sample. The cell is moved in horizontal direction on the stage of an inverted microscope and plankton species encountered in the field are enumerated.

A number of replicate samples are enumerated to calculate plankton/lit.  
 $\text{Plankton}(\text{units}/\text{lit}) = n \times c/v$

Where,  
 n = number of plankton in 1ml  
 c = Volume of concentrate  
 v = Volume of sample in lit.

## RESULT AND DISCUSSION

According to Kedar, (2002) reported 7 species belong to Ostracods in Rishi lake and Yedshi lake of Washim District of Maharashtra. Pawar and Pule, (2005) observed 4 species of Ostracods from Petwadaj dam of Nanded, Maharashtra. Jayabhaye and Madalpure, (2006) recorded 3 species of Ostracods in Paroladam

of Hingoli. Sakhre and Joshi, (2006) observed 4 species of Ostracods in Yeldari reservoir. Ansari and Raja, (2007) founded only one species belong to Ostracods in two freshwater bodies of Aligarh, Uttar Pradesh. Rajan, *et al.*, (2007) observed 3 species of Ostracods in three polluted water bodies of Virudhunagar District, Tamilnadu.

In the present investigation, 2 species were reported at all the three sampling sites A, B and C of the lake under study during Jun 2021 – May 2022.

In site A, during 2021-22, 2 species were recorded among which *Steno cypris* sp. (44 no./lit) and *Cypris* sp. (43 no./lit).

In site B, during 2021-22, 2 species were recorded *Steno cypris* sp. (44 no./lit) and *Cypris* sp. (36 no./lit).

In site C, during 2021-22, 2 species were recorded. *Steno cypris* sp. (29 no./lit) and *Cypris* sp. (24 no./lit).

Among the different species in site A, *Steno cypris* sp. was dominant by Ostracods, *Cypris* sp. In site B, *Steno cypris* sp. was dominant by Ostracods, *Cypris* sp. In site C, *Steno cypris* sp. was dominant by Ostracods, *Cypris* sp.

Bhagat, *et al.*, (2010) recorded 5 species of Astracoda in Ambadi irrigation dam of District Akola. Kumar, *et al.*, (2011) observed one genera each of Ostracods of a Varasda wetland system of Rajkot District, Gujarat. Shashikant Sitre and Mahendra Thakare, (2013) observed ostracods by one species in Balaji temple tank of Chimur city of Chandrapur District (M.S.). Balakrishna, *et al.*, (2013) reported 2 species of Ostracods at Dharmasagar lake of Dharmasagar of Warangal District, Andhra Pradesh. Kamble and Mudkhede, (2013) observed only *Cypris* in Ambadi reservoir of taluka Kinwat, Maharashtra. Jaiswal, *et al.*, (2014) reported two species of Ostracods were distributed in a freshwater of Rangavali Dam in Navapur, District Nandurbar (M.S.). Gunwant Gadekar, (2014) founded 3 species of Ostracods in Pangdi lake of Gondia of District Gondia, Maharashtra. Gunwant Gajanan Sontakke and Satish Mokashe, (2014) observed 2 species of Ostracods in Dekhu reservoir from Aurangabad, Maharashtra.

Ferda percinpal and Hisamettin Balkis (2015) observed 75 species of Ostracods in Bandirma bay, the Marmara sea Turkey.

Pokale S.S. (2018) founded 2 species of ostracods of Valvan lake of Lonavala, Maharashtra.

Mehmet Yavuzatmaca (2020) observed 26 species of ostracods in streams and lakes in Turkey.

In the present investigation the Ostracods density is a maximum during the winter and minimum during the monsoon season. Patil, (2008) recorded the maximum population of Ostracods during the summer season and minimum during the monsoon season. Pejaware and Gurao, (2008) observed them only during monsoon and stated that these are pollution sensitive species. Nirmal Kumar, *et al.*, (2011) founded the maximum population of Ostracods during the summer season and minimum during the monsoon season of a Varasda wetland system Gadekar, (2014) observed maximum Ostracods population were reported in summer, in March month while minimum in monsoon season, i.e. in July month in Pangdi lake of Gondia of District Gondia, Maharashtra. Shashikant

Sitre, (2014) reported maximum Ostracoda population were observed in summer months and minimum in rainy season in Sunkadin Naik lake of Nagpur city (M.S.).

The occurrence and abundance of living ostracods are closely connected with water parameters, permitting Recent ostracods to be considered as 'modern analogues' of ostracod fossils (Rodriguez-Lazaro and Ruiz Munˆoz, 2012; Wangetal., 2021a). The number of living species is about 10 to 20 thousand, and only half of the se have been described in formal style (Meisch, 2000; Rodriguez-Lazaro and Ruiz-Munˆoz, 2012). About two thousand non-marine species have been reported, and all belong to Podocopida (Meisch, 2000; Martensetal., 2008). Non-marine species are characterized by ecological diversity (Smith and Horne, 2002; Horne, 2003), and any species could have its eco logical peculiarity (Rodriguez-Lazaro and Ruiz-Munˆoz, 2012; Wangetal., 2021a, Wang etal., 2021b).

The Yamdrok- tsobas in experience sa temperate and semiarid climate, and is covered by alpinesteppe and alpinemeadow (Guo et al., 2018). The meteorological information from 1980 to 2016— recorded in the Langkazi station is shown as follows (Wangetal., 2021c): Mean monthly temperature ranges from 4.5 to 10.3 °C. The lowest temperature is in January and the highest temperature is in July. Mean monthly precipitation varies from 0.3 to 114.4 mm. The precipitation from June to September occupies 89 % of the annual precipitation. Mean monthly evaporation is between 981.9 and 2038.6mm with the lowest value in September and the highest value in April.

## CONCLUSION

In the present investigation, the maximum Ostracods during the winter season is probably due to availability of suitable food and favorable temperature and minimum density in monsoon season which could be due to dilution of water resulting in fewer nutrients and due to reduction of transparency and is solved oxygen.

S.N.	Parameters	MONSOON	WINTER	SUMMER	Total
1	Ostracods	1.50 ± 1.12	10.00 ± 4.64	10.50 ± 4.72	7.33 ± 1.68

**Table 1.1 : Seasonal variation of Zooplankton from Site A of Popatkhd Dam during Jun 2021 to May 2022**

S.N.	Parameters	MONSOON	WINTER	SUMMER	Total
5	Ostracods	0.75 ± 1.30	7.00 ± 3.67	5.50 ± 1.66	4.42 ± 1.05

**Table 1.2: Seasonal variation of Zooplankton from Site B of Popatkhd Dam during Jun 2021 to May 2022**

S.N.	Parameters	MONSOON	WINTER	SUMMER	Total
5	Ostracods	1.25 ± 0.83	9.00 ± 2.74	5.50 ± 2.18	5.25 ± 0.80

**Table 1.3: Seasonal variation of Zooplankton from Site C of Popatkhd Dam during Jun 2021 to May 2022**

S.N.	Parameters	A	B	C	Total
1	Ostracods	7.33 ± 5.66	6.67 ± 4.64	4.42 ± 3.62	6.14 ± 0.84

**Table1.4: Yearly variation of Zooplankton from sites of Popatkhd Dam during Jun 2021 to May 2022**

## REFERENCES

- Adoni, A. D. (1985) Studies on microbiological of Sagarlake, Ph.D Thesis, Sagar University Sagar, Madhya Pradesh. pp.243.
- Adoni, A. D. (1985) Work book on limnology, Dept. of Environment, Govt. of India, Bandana printing service, New Delhi. pp.88.
- Ansari, S. and Raja, W. (2007) Diversity and distribution of zooplankton in a freshwater body of Aligarh region. Fisheries and Aquaculture Strategic outlook for Asia. Book of Abstracts. 8th Asian Fisheries Forum. pp.257-258.
- APHA, (1985) Standard Methods for the Examination of Water and Waste Water, American Public Health Association, New York. 16th Edition.
- Balakrishna, D., Mahesh, T., Samatha, D. and Ravinder Reddy T. (2013) Zooplankton diversity indices of Dharmasagar Lake, Warangal District (A.P.). International Journal of Research in Biological Sciences. Vol.3 (3): 109-111.
- Bhagat, V. B., Meshram, C. B., Bobdey, A. D. and Sawane, A. P. (2010) Diversity of microfauna in Ambadi irrigation dam, of District Akola (Maharashtra). Biosci. Biotech. Res. Comm. Vol. (3 and 1): 104-106.
- Edmondson, W. T. (1959) Freshwater Biology, John Wiley and Sons Inc. N.Y. pp.420-494.
- Ferda P.P., Hisamettin B. (2015) Environmental and Ecological Assessment of Ostracodes inhabiting in Bandirma bay, the Marmara Sea, Turkey, International Journal of Fisheries and Aquatic studies Vol.2(5): 285-299
- Gadekar, G. P. (2014) Seasonal variations in zooplankton diversity of Railway Pond, Gondia, District Gondia.
- Gajanan Sontakke and Satish Mokashe, (2014) Diversity of zooplankton in Dekhu reservoir from Aurangabad, Maharashtra. Journal of Applied and Natural Science. Vol.6(1): 131-133.
- Gunwant, P. Gadekar., Kalpana P. Ghoshal and Ashish S. Gadwe, (2014) Studies on zooplankton diversity of Pangdi Lake, Gondia, Dist. Gondia, Maharashtra. International Journal of Environmental Biology. Vol. 4 (1): 47-50.
- Guo, C., Ma, Y., Meng, H., Hu, C., Li, D., Liu, J., Luo, C., Wang, K., 2018. Changes in vegetation and environment in Yamzhog Yumco Lake on the southern Tibetan Plateau over past 2000 years. Palaeogeogr. Palaeoclimatol. Palaeoecol. 501, 30–44.
- Jaiswal, D. P., K. D. Ahirrao and K. B. Shejule, (2014) Study of zooplankton population in a freshwater, Rangavali Dam, Navapur, Dist- Nandurbar (M.S.) India. Vol. 2 (12): 1355-1365.

- Jayabhai, U.M. and Madlapure, V.R. (2006) Studies on zooplankton diversity in Parola dam, Hingoli, Maharashtra, India. J. Aqua. Bio. Vol. 21 (2): 67-71.
- Kamble, A. T. and L. M. Mudkhede, (2013) Zooplankton diversity of Ambadi reservoir taluka Kinwat, Maharashtra. International Journal of Biomedical and Advance Research. Vol. 4 (3): 179-181.
- Kedar, G. T. and G. P. Patil, (2002) Studies on the biodiversity and physico-chemical status of the Rishi lake, Karanja. (M.S.) Ph.D. Thesis, Amravati University, Amravati.
- Mehmat Yavuzatmaca (2020) Diversity analysis of Non-marine analysis Ostracods (crustacea, Ostracoda) in streams and lakes in Turkey. Turkish journal of Zoology (2020) 44: 519-530
- Meisch, C., 2000. Fresh water Ostracoda of Western and Central Europe. Heidelberg.
- Nirmal Kumar J. I., Manishita Das, Rana Mukherji and Rita N. Kumar, (2011) Assessment of zooplankton diversity of a tropical wetland System Int. J. of Pharm. and Life Sci. Vol.2(8): 983-990.
- Patil, G. P., Kedar, G. T. and Yeole, S. M. (2008) Zooplankton biodiversity study of two water bodies in Washim District (M.S.). J. Aqua. Biol. Vol. 23 (1): 13-17.
- Pawar, S. K. and Pulle, J. S. (2005) Qualitative and quantitative study of zooplankton in Pethwadaj Dam, Nanded, Maharashtra, India. J. Aqua Biol. Vol. 20 (2): 53-57.
- Pejavar Madhuri and Gurao Meenakshi, (2008) Seasonal variation of zooplankton in Nirmalaya (Religious refuges), enclosure of Kalwalake, Thane, Maharashtra. J. Aqua. Biol. Vol. 23 (1): 22-25.
- Pejawar, M. and Gurao, M. (2008) Study of water quality of Jail and Kalwa lakes, Thane, Maharashtra, India. J. Aqua. Biol. Vol. 23 (1): 44-50.
- Prescott, G. W. (1954) The fresh – water algae. W.M.C. Brown company. Dubuque, USA.
- Rodriguez-Lazaro, J., Ruiz-Munˆoz, F., 2012. A general introduction to ostracods: morphology, distribution, fossil record and applications. In Developments in Quaternary Sciences 17, 1-14. Elsevier.
- Rajan, M. K., Mahendran, M., Pavaraj, M. and S. Muniasamy, (2007) Zooplanktonic assemblage in three polluted water bodies of virudhanagar district, Tamil Nadu. J. Aqua Biol. Vol. 23 (1): 18-21.
- Sakhare, V. B. and P. K. Joshi, (2006) Plankton diversity in Yeldarisevior, Maharashtra. Fishing chimes Vol. 25 (12): 23-25.
- Sehgal K. L., (1983), Planktonic Copepoda of Fresh Water System. ITCR print, New Delhi.
- Shashikant R. Sitre and Mahendra G. Thakare, (2013) Zooplankton fauna of Balaji Temple Tank of Chimur city of Chandrapur District (M.S.) during summer season Lokavishkar International E-Journal. Vol.2(4): 20-24.
- Sitre, Shashikant R. (2014) Zooplankton fauna assessment of Naiklake of Nagpur City (M.S.) India, Online International Interdisciplinary Research Journal, Vol.4(2): 118-123.
- Sitre, Shashikant R. (2013) Zooplankton biodiversity in Ghotimbala reservoir in Bhadravati Tehsil of Chandrapur District, Online International Interdisciplinary Research Journal, Vol. 3 (1): 61-67.
- Smith, A.J., Horne, D.J., 2002. Ecology of marine, marginal marine and nonmarine ostracodes. Washington DC Am. Geophys. Union Geophys. Monogr. Series 131, 37-64.
- Wang, C., Kuang, X., Wang, H., Guo, G., Song, G., 2021a. Ostracods as proxy for palaeoclimatic change: Aneessential role of bioculture experiment taking Limnocythe reinopinata (Crustacea: Ostracoda) as an example. Ecol. Indic. 121, 107000.
- Wang, C., Wang, H., Kuang, X., Guo, G., 2021b. Life stages and morphological variations of Limnocythe reinopinata (Crustacea, Ostracoda) from Lake Jiang-Co (northern Tibet): a bioculture experiment. ZooKeys 1011, 25–40.
- Wang, C., Zhou, H., Kuang, X., Hao, Y., Shan, J., Chen, J., Li, L., Feng, Y., Zou, Y., Zheng, Y., 2021c. Water quality and health risk assessment of the water bodies in the Yamdrok tsobas basin, southern Tibetan Plateau. J. Environ. Manage. 300, 113740.
- Zar, J. H. (2005) Biostatistical Analysis (4th Ed.), Pearson Education Inc., Delhi.